Art analysis of the classification from 2024

This has been written in 2025.

The main objective is to classify the publications by themes and sub-theme.

The work from 2024

It seems to work well. However there are two possible issues:

- There are not enough themes to cover all the possible scientific publications.

Let's consider only the publications that are related to the given themes.

- The classification is only made on the *abstract* of the publication, and not on the title or even the keywords that the *HAL* **API** could give for istance.

I think it could be good if we gave the title, the abstract and the retrieved keywords altogether to the *classify_abstract_combined()* function.

It will give the related *theme* if the publication is within the covered range of themes.

In fact, it may be necessary to replace the *Flask API* because:

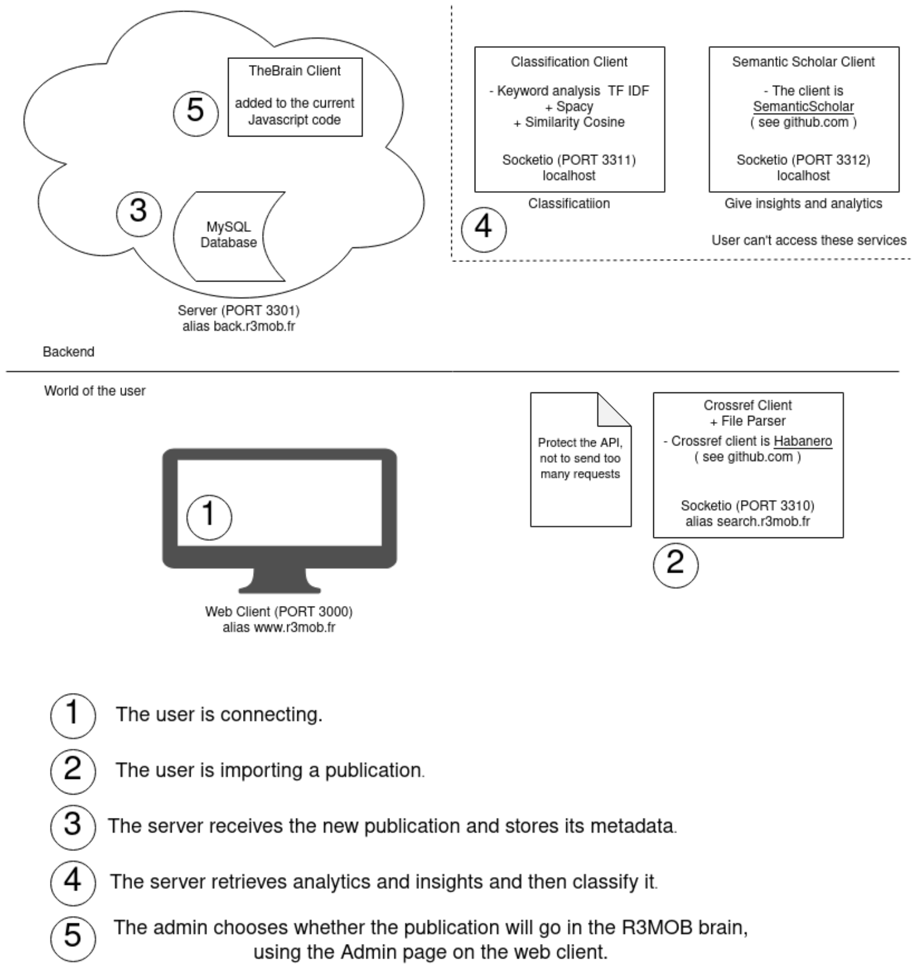
```
WARNING: This is a development server.
Do not use it in a production deployment.
Use a production WSGI server instead.
```

So anyway, the current *Flask API* will have to be reworked. Here are some ideas:

1. **Use HTTP requests with *Flask***. This is the easiest way because it requires small changes, however this is not designed for that I suppose. In fact, the only good way to get a *Flask* server for production is to use ***gunicorn***.
2. **Use *Child Processes* in Node.js**. Here is a more detailed guide ***right here***.
3. **Use *Websocket* like *Socketio***. I don't want the *websocket* to require an authentication because it will be too hard to code. That's why the client must not have the right to communicate with the *websocket*. Only the server should do that. So for this method, the server classifies the publication and not the client.

Why is it possible to use `flask_socketio` for production? Because the function `flask_socketio.SocketIO.run()` directly calls **python-gevent** or **python-eventlet** if it is available, ***the doc*** says.

For any of these methods, here is the generic plan on this picture:



1 The user is connecting.

2 The user is importing a publication.

3 The server receives the new publication and stores its metadata.

4 The server retrieves analytics and insights and then classify it.

5 The admin chooses whether the publication will go in the R3MOB brain, using the Admin page on the web client.

Figure 1: Classification Module

Better *README* file and *explanations.*

I had some issues to launch the *flask* app.

Here is a more detailed guide on how to use it for **python3.13**:

```
cd classification/code/
python3 -m venv .env_classification
source .env_classification/bin/activate
pip install -r requirements.txt
```

where the *requirements.txt* file is:

```
spacy==3.8.7
flask==3.1.1
nltk==3.9.1
scikit-learn==1.6.1
```

Then do:

```
python -m spacy download en_core_web_lg
./start_classification.sh
```

If there is the error `port 5000 already used`, just do:

```
ps aux | grep app.py
kill -9 <app.py pid>
```

My own thoughts about the idea

The solution is good, nothing to add, except there are not enough themes.

The different solutions that already exist.

It is possible to use a *Natural Language Processing* to get better results. However, it is not that easy.

In fact, I just need to use **BERT** which is an *NLP model* (*+68M monthly downloads*). It could be very powerful, more powerful than the current *classification* model.

But the current model from 2024 is good, I don't want to mess with it.

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